



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/766,784	01/28/2004	Ian Davies	CHAP.0104	4115
23669	7590	06/30/2006	EXAMINER	
HUFFMAN LAW GROUP, P.C. 1832 N. CASCADE AVE. COLORADO SPRINGS, CO 80907-7449				BRADLEY, MATTHEW A
ART UNIT		PAPER NUMBER		
		2187		

DATE MAILED: 06/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/766,784	DAVIES ET AL.	
	Examiner Matthew Bradley	Art Unit 2187	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 28 January 2004.

2a) This action is **FINAL**. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-71 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-71 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 28 January 2004 is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1/28/04.

4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5) Notice of Informal Patent Application (PTO-152)

6) Other: _____.

DETAILED ACTION***Information Disclosure Statement***

The information disclosure statement (IDS) submitted on 28 January 2004 was filed on the mailing date for application 10/766,784. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the Examiner is considering the information disclosure statement with a signed and initialed copy being attached hereto.

Claim Status

Claims 1-71 remain pending and are ready for examination.

Specification

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 50-51 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per claim 50, the instant claim language recites, "...a computer usable medium having computer readable program code causes the storage controller, . " This is indefinite. Insofar as it appears to be clear, the Examiner notes that no

additional limitations are present which would cause the storage controller to perform any action.

As per claim 51, the instant claim language recites, "... a transmission medium comprising computer readable program code provides the storage controller." This is indefinite. The Examiner is unsure as to how the code provides the storage controller.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 50-51 are not limited to tangible embodiments. In view of applicants' disclosure, specification pages 35-37, paragraph 81, the medium is not limited to tangible embodiments, instead being defined as including both tangible embodiments (e.g., RAM, ROM, EEPROM, ...) and intangible embodiments (e.g., carrier wave). As such, the claims are not limited to statutory subject matter and are therefore non-statutory.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-8, 10, 13-27, 29-34, 39-52, and 54-70 are rejected under 35 U.S.C. 102(b) as being anticipated by Hubis et al (U.S. 6,343,324) hereinafter referred to as Hubis. The instant 35 U.S.C. 102(b) rejections are made in light of the 35 U.S.C. 112 2nd rejections made *supra*.

As per independent claim 1, Hubis teach,

- A storage controller, comprising: a device interface adapter, for interfacing the storage controller to a plurality of logical storage devices; a host interface adapter, for interfacing the storage controller to a plurality of host computers; and a microprocessor, coupled to said device interface adapter and host interface adapter, for processing requests to transfer data between said plurality of logical storage devices and said plurality of host computers;
(Column 7 lines 22-38 as shown in Figure 2A)
- wherein each of said requests specifies one of said plurality of host computers and one of said plurality of logical storage devices for transferring said data between, wherein said host interface adapter is configured to receive said requests and to determine for each of said requests whether the host computer identified in said request is allowed to access the logical storage device identified in said request (Column 11 lines 45-53).

As per dependent claim 2, Hubis teach,

- The storage controller of claim 1, wherein if said host interface adapter determines said host computer identified in said request is

allowed to access said logical storage device identified in said request, said host interface adapter provides said request to said microprocessor, wherein said microprocessor responsively controls said device interface adapter to cause said device interface adapter to access said logical storage device specified in said request to transfer said data between said logical storage device and the storage controller (Column 11 lines 45-53).

As per dependent claim 3, Hubis teach,

- The storage controller of claim 1, wherein if said host interface adapter determines said host computer identified in said request is not allowed to access said logical storage device identified in said request, said host interface adapter transmits to said host computer a response indicating that said host computer identified in said request is not allowed to access said logical storage device identified in said request (Column 11 lines 53-57).

As per dependent claim 4, Hubis teach,

- The storage controller of claim 1, wherein if said host interface adapter determines said host computer identified in said request is not allowed to access said logical storage device identified in said request, said host interface adapter provides to said microprocessor an indication that said host computer identified in said request is not allowed to access said logical storage device identified in said request (Column 11 lines 53-57).

As per dependent claim 5, Hubis teach,

- The storage controller of claim 4, wherein said microprocessor causes said host interface adapter to transmit a response to said host computer identified in said request in response to said indication, wherein said response indicates said host computer is not allowed to access said logical storage device identified in said request (Column 11 lines 53-57).

As per dependent claim 6, Hubis teach,

- The storage controller of claim 1, wherein said host interface adapter is configured to interface said storage controller to said one or more host computers via an interface protocol (Column 7 lines 22-38).

As per dependent claim 7, Hubis teach,

- The storage controller of claim 6, wherein said interface protocol comprises Fibre Channel (Column 7 lines 7-10).

As per dependent claim 8, Hubis teach,

- The storage controller of claim 6, wherein said interface protocol comprises Small Computer Systems Interface (SCSI) (Column 7 lines 11-14).

As per dependent claim 10, Hubis teach,

- The storage controller of claim 6, wherein said interface protocol comprises one of the following protocols: Infiniband, Ethernet, TCP/IP, HIPPI, Token Ring, Arcnet, FDDI, LocalTalk, ESCON,

FICON, ATM, SAS, SATA, and combinations thereof (Column 7 lines 19-21).

As per dependent claim 13, Hubis teach,

- The storage controller of claim 1, wherein said microprocessor performing said processing requests comprises performing redundant array of inexpensive disks (RAID) processing (Column 7 lines 37-38).

As per dependent claim 14, Hubis teach,

- The storage controller of claim 1, wherein said plurality of logical storage devices comprise one or more physical storage devices (Column 7 lines 39-46).

As per dependent claim 15, Hubis teach,

- The storage controller of claim 1, wherein said plurality of logical storage devices comprise one or more disk storage devices (Column 7 lines 39-46).

As per dependent claim 16, Hubis teach,

- The storage controller of claim 1, wherein said plurality of logical storage devices comprise one or more CDROM storage devices (Column 7 lines 39-46).

As per dependent claim 17, Hubis teach,

- The storage controller of claim 1, wherein said plurality of logical storage devices comprise one or more tape storage devices (Column 7 lines 39-46).

As per dependent claim 18, Kitamura teach,

- The storage controller of claim 1, further comprising: a plurality of said microprocessors, coupled to said host interface adapter and said device interface adapter, wherein said host interface adapter determines which one of said plurality of microprocessors is configured to process requests for said logical storage device identified in said request and provides said request to said determined one of said plurality of microprocessors (Figure 2A shown as the individual fibre channel processors).

As per dependent claim 19, Hubis teach,

- The storage controller of claim 1, wherein each of said requests specifies one of said plurality of host computers based on a unique world wide name (Column 4 lines 49-53).

As per dependent claim 20, Hubis teach,

- The storage controller of claim 1, wherein each of said requests specifies one of said plurality of host computers based on an internet protocol address (Column 7 lines 19-21).

As per dependent claim 21, Hubis teach,

- The storage controller of claim 1, wherein each of said requests specifies one of said plurality of host computers based on an identifier in a SCSI request (Column 7 line 14).

As per dependent claim 22, Hubis teach,

- The storage controller of claim 1, wherein each of said requests specifies one of said plurality of logical storage devices in a protocol-specific manner (Column 7 lines 10-14).

As per dependent claim 23, Hubis teach,

- The storage controller of claim 22, wherein said protocol-specific manner comprises an identifier in a SCSI request (Column 7 line 14).

As per independent claim 24, Hubis teach,

- A storage controller for providing hosts controlled access to logical storage devices, comprising: a memory, for storing an access table specifying which of the hosts has access to which of the logical storage devices; and (Figure 2A item 182)
- an interface adapter, coupled to said memory, configured to interface the storage controller with a transport medium, receive on said transport medium from one of the hosts a request to access one of the logical storage devices, and determine from said access table whether said one of the hosts has access to said one of the logical storage devices (Column 3 lines 43-58).

As per dependent claim 25, Hubis teach,

- The storage controller of claim 24, wherein said interface adapter is configured to interface the storage controller with said transport medium according to a predetermined protocol (Column 11 lines 45-51).

As per dependent claim 26, Hubis teach,

- The storage controller of claim 25, wherein said predetermined protocol comprises Fibre Channel (Column 7 lines 7-10).

As per dependent claim 27, Hubis teach,

- The storage controller of claim 25, wherein said predetermined protocol comprises Small Computer Systems Interface (SCSI) (Column 7 lines 11-14).

As per dependent claim 29, Hubis teach,

- The storage controller of claim 25, wherein said predetermined protocol comprises one of the following protocols: Infiniband, Ethernet, TCP/IP, HIPPI, Token Ring, Arcnet, FDDI, LocalTalk, ESCON, FICON, ATM, SAS, SATA, and combinations thereof (Column 7 lines 19-21).

As per dependent claim 30, Hubis teach,

- The storage controller of claim 25, wherein said predetermined protocol comprises a low-level block protocol (Column 11 lines 51-53). *The Examiner notes that as the system of Hubis allows the command to complete, or once access is granted, the system will access the data at a low-level on the drive associated with the logical volumes.*

As per dependent claim 31 Hubis teach,

- The storage controller of claim 24, further comprising: a microprocessor, coupled to said interface adapter, for programming

said interface adapter to cause said interface adapter to transfer data on said transport medium (Column 11 lines 45-51).

As per dependent claim 32, Hubis teach,

- The storage controller of claim 31, wherein if said interface adapter determines that said one of the hosts has access to said one of the logical storage devices, said interface adapter provides said request to said microprocessor, and said microprocessor responsively processes said request to cause said one of the logical storage devices to be accessed (Column 11 lines 51-53).

As per dependent claim 33, Hubis teach,

- The storage controller of claim 31, wherein said microprocessor comprises a general purpose microprocessor (Column 11 lines 51-53).

As per dependent claim 34, Hubis teach,

- The storage controller of claim 31, wherein said microprocessor is distinct from said interface adapter (Column 11 lines 22-29). *The Examiner notes that as shown in Figure 2A and with respect to the citing, the instant microprocessor is different from the interface adapter.*

As per dependent claim 39, Hubis teach,

- The storage controller of claim 31, wherein said microprocessor does not include a direct memory access controller (Column 15 line

53 to Column 16 line 9). *The Examiner notes herein that the microprocessor is distinct from the controller as noted supra.*

As per dependent claim 40, Hubis teach,

- The storage controller of claim 31, further comprising: a storage device interface adapter, coupled to said microprocessor, configured to interface the storage controller with the logical storage devices (Column 15 line 53 to Column 16 line 9).

As per dependent claim 41, Hubis teach,

- The storage controller of claim 40, wherein said microprocessor causes said storage device interface adapter to transfer data between the logical storage devices and the storage controller in response to said interface adapter providing said request to said microprocessor (Column 11 lines 51-53).

As per dependent claim 42, Hubis teach,

- The storage controller of claim 24, wherein said interface adapter comprises a single integrated circuit (Figure 2A shown as the IC between the instant devices comprising the adapter).

As per dependent claim 43, Hubis teach,

- The storage controller of claim 24, wherein said interface adapter comprises a set of integrated circuits specialized for performing a predetermined protocol on said transport medium (Figure 2A shown as the 'controller'). *The Examiner notes that as shown in Figure*

2A, there exists multiple integrated circuits for which the adapter performs a protocol on over the transport medium.

As per dependent claim 44, Hubis teach,

- The storage controller of claim 24, wherein the storage controller creates said access table in said memory in response to user input (Column 9 lines 52-57). *The Examiner notes that Hubis teach the logging in of the host computers to the array controller that causes the generation of the access table. Thus, Hubis teach the instant limitation of user input based on the dynamic generation of the table due to the host computers logging in.*

As per dependent claim 45, Hubis teach,

- The storage controller of claim 44, further comprising: a management controller, coupled to said memory, for creating said access table in response to user input (Column 8 lines 52-57).

As per dependent claim 46, Hubis teach,

- The storage controller of claim 24, wherein said interface adapter maps a first identifier to a second identifier, wherein said first identifier is included in said request and is used by the host to specify said one of the logical storage devices, wherein said second identifier is used by the storage controller to specify said one of the logical storage devices (Column 8 lines 53-58).

As per dependent claim 47, Hubis teach,

- The storage controller of claim 46, wherein said interface adapter uses said second identifier to determine from said access table whether said one of the hosts has access to said one of the logical storage devices (Column 8 lines 55-58).

As per dependent claim 48, Hubis teach,

- The storage controller of claim 24, wherein said memory for storing said access table is comprised within said interface adapter (Figure 2A as shown with respect to item 182).

As per dependent claim 49, Hubis teach,

- The storage controller of claim 24, wherein said memory for storing said access table is directly coupled to said interface adapter (Figure 2A shown as the interconnection between 180 and 182).

As per dependent claim 50, Hubis teach,

- The storage controller of claim 24, wherein a computer program product comprising a computer usable medium having computer readable program code causes the storage controller, wherein said computer program product is for use with a computing device (Column 21 lines 43-51).

As per dependent claim 51, Hubis teach,

- The storage controller of claim 24, wherein a computer data signal embodied in a transmission medium comprising computer-readable program code provides the storage controller (Column 21 lines 43-51).

As per independent claim 52, Hubis teach,

- A method for controlling access by host computers to logical storage devices, the method comprising: performing a protocol to receive a request from a host computer to access a logical storage device; (Column 8 lines 43-46)
- determining whether the host computer has access to the logical storage device; and (Column 9 lines 52-57)
- causing the logical storage device to transfer data, if the host computer has access to the logical storage device based on said determining; (Column 11 lines 51-53)
- wherein said performing the protocol and said determining are performed by an interface adapter, and said causing the logical storage device to transfer the data is performed by a microprocessor distinct from the interface adapter (Column 11 lines 45-53).

As per independent claim 54, Hubis teach,

- A storage controller for providing host computers access to storage devices, comprising: a microprocessor, for identifying each of the storage devices according to a unique internal identifier, and for processing requests to access the storage devices, each of said requests including a host identifier and an external identifier, said host identifier identifying one of the host computers making said

request, and said external identifier identifying one of the storage devices to be accessed; and (Column 11 lines 37-44)

- a host interface adapter, coupled to said microprocessor, for receiving said requests from the host computers and mapping said external identifier received in said request to its said unique internal identifier based on said host identifier received in said request (Column 11 lines 45-53).

As per dependent claim 55, Hubis teach,

- The storage controller of claim 54, further comprising: a mapping table, accessible by said host interface adapter, for storing mapping information, wherein said host interface adapter maps said external identifier received in said request to its said unique internal identifier based on said host identifier received in said request using said mapping information stored in said mapping table (Column 11 lines 16-20).

As per dependent claim 56 Hubis teach,

- The storage controller of claim 55, wherein each unique combination of host identifier and external identifier identifies a single one of the storage devices according to a many-to-one mapping (Column 4 lines 59-63).

As per dependent claim 57, Hubis teach,

- The storage controller of claim 54, wherein said host interface adapter provides said unique internal identifier and said request to

said microprocessor for processing after said mapping said external identifier to said unique internal identifier (Column 11 lines 8-15).

As per dependent claim 58, Hubis teach,

- The storage controller of claim 54, wherein said host interface adapter is further configured to perform a low-level protocol to interface the storage controller with the host computers (Column 11 lines 51-53). *The Examiner notes that as the system of Hubis allows the command to complete, or once access is granted, the system will access the data at a low-level on the drive associated with the logical volumes.*

As per dependent claim 59, Hubis teach,

- The storage controller of claim 54, wherein said unique internal identifier identifies a logical storage device, wherein said logical storage device comprises a grouping of physical storage devices (Column 5 lines 39-45 and Column 5 lines 48-49).

As per dependent claim 60, Hubis teach,

- The storage controller of claim 54, wherein said unique internal identifier identifies a logical storage device, wherein said logical storage device comprises a portion of a grouping of physical storage devices (Column 6 lines 39-45).

As per dependent claim 61, Hubis teach,

- The storage controller of claim 54, wherein said unique internal identifier identifies a logical storage device, wherein said logical

storage device comprises a portion of a physical storage device (Column 6 lines 39-45).

As per dependent claim 62, Hubis teach,

- The storage controller of claim 54, wherein each of said requests specifies one of the storage devices in said external identifier in a protocol-specific manner (Column 6 lines 39-45).

As per dependent claim 63, Hubis teach,

- The storage controller of claim 62, wherein said protocol-specific manner comprises a SCSI logical unit number (Column 17 lines 19-21).

As per dependent claim 64, Hubis teach,

- The storage controller of claim 54, wherein said external identifier comprises a SCSI logical unit number (Column 17 lines 19-21).

As per dependent claim 65, Hubis teach,

- The storage controller of claim 54, wherein said host interface adapter is further configured to perform access control based on said unique internal identifier and said host identifier (Column 17 lines 60-67).

As per independent claim 66, Hubis teach,

- A method for mapping host-specific storage device identifiers to storage controller-specific storage device identifiers, the method comprising: receiving from a host computer a request to access one of a plurality of storage devices coupled to a storage controller,

the request specifying an identifier of the host computer and an identifier of the one of the plurality of storage devices, wherein said receiving is performed by a host interface adapter of the storage controller; (Column 11 lines 38-44)

- mapping a combination of the host computer identifier and the identifier of the one of the plurality of storage devices to a unique identifier used by a microprocessor of the storage controller to identify the one of the plurality of storage devices, wherein said mapping is performed by the host interface adapter; and (Column 11 lines 8-15)
- providing the unique identifier to the microprocessor for processing the request, wherein said providing is performed by the host interface adapter (Column 11 lines 45-53).

As per independent claim 67, Hubis teach,

- A storage controller, comprising: a first microprocessor, for processing requests from a host computer to access one of a first set of logical storage devices coupled to the storage controller; a second microprocessor, for processing requests from said host computer to access one of a second set of logical storage devices coupled to the storage controller; and (Column 11 lines 8-15). *The Examiner notes that Hubis teach multiple controllers thereby anticipating the instant limitation.*

- an interface adapter, coupled to said first and second microprocessors, for receiving said requests from said host computer, and for each of said requests determining whether said request specifies a logical storage device in said first set or said second set and providing said request to one of said first and second microprocessors based on said determining (Column 11 lines 45-53).

As per dependent claim 68, Hubis teach,

- The storage controller of claim 67, wherein said first and second set of logical storage devices are distinct (Column 5 lines 48-52 as shown in Figure 2A).

As per dependent claim 69, Hubis teach,

- The storage controller of claim 67, wherein said first and second set of logical storage devices are programmable (Column 5 lines 48-52).

As per dependent claim 70, Hubis teach,

- The storage controller of claim 67, wherein said first and second set of logical storage devices are user-configurable (Column 5 line 65 to Column 6 line 2).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought

be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims **9** and **28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hubis and in view of Camble et al (U.S. 6,999,999) hereinafter referred to as Camble.

As per dependent claim **9**, Hubis teach the limitations as noted *supra*.

Hubis does not explicitly teach the use of iSCSI.

Camble teach, the storage controller of claim 6, wherein said interface protocol comprises Internet SCSI (iSCSI) (Column 7 lines 37-40).

Hubis and Camble are analogous art because they are from the same field of endeavor, namely computer storage systems.

At the time of invention it would have been obvious to one of ordinary skill in the art, having both the teachings of Hubis and Camble before him/her, to extend the interfaces of Hubis to encompass iSCSI systems for the benefit of increased compatibility.

The motivation for doing so would have been that increased system capability allows for additional systems that the Hubis system is employed upon. Increasing the number of interfacing standards also allows more flexibility when selecting the components to comprise the system.

Therefore, it would have been obvious to combine Hubis with Camble for the benefit of increased capability to obtain the invention as specified in claims **9** and **28**.

As per dependent claim **28**, the combination of Hubis and Camble teach,

- The storage controller of claim 25, wherein said predetermined protocol comprises Internet SCSI (iSCSI) (Column 7 lines 37-40 of Camble).

Claims 11-12, 35-38, 53, and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hubis and in view of Kitamura et al (U.S. 2002/0199071) hereinafter referred to as Kitamura.

As per dependent claim 11, Hubis teach the limitations as noted *supra*.

Hubis does not explicitly teach the use of a buffer memory.

Kitamura teach, a buffer memory, coupled to said device interface adapter and said host interface adapter, for buffering data transferred between said plurality of host computers and said plurality of logical storage devices via said host interface adapter and said device interface adapter (Paragraph 0026). *The Examiner notes that the cache memory of Kitamura anticipates the instant limitation of buffer memory.*

Hubis and Kitamura are analogous art because they are from the same field of endeavor, namely selectively allowing host computers to access storage devices.

At the time of invention it would have been obvious to one of even rudimentary skill in the art, having both the teachings of Hubis and Kitamura before him/her, to integrate the cache memory of Kitamura into Hubis for the benefit increasing the speed of processing accesses from the host to the storage system.

The motivation for doing so would have been that, the cache memory stores data frequently read from the disk or temporarily stores write data to be transferred from the host or the like to the storage system to thereby increase the speed of processing accesses from the host or the like (Paragraph 0026 of Kitamura).

Therefore, it would have been obvious to combine Hubis with Kitamura for the benefit of increased speed when processing accesses from the host to the storage system to obtain the invention as specified in claims 11-12, 35-38, 53, and 71.

As per dependent claim 12, the combination of Hubis and Kitamura teach,

- The storage controller of claim 11, wherein said microprocessor manages use of said buffer memory by said host interface adapter and said device interface adapter (Paragraph 0026 as shown in Figure 1 of Kitamura).

As per dependent claim 35, the combination of Hubis and Kitamura teach,

- The storage controller of claim 31, further comprising: a buffer memory, coupled to said interface adapter, for buffering data transferred between the hosts and the logical storage devices (Paragraph 0026 as shown in Figure 1 of Kitamura).

As per dependent claim 36, the combination of Hubis and Kitamura teach,

- The storage controller of claim 35, wherein said microprocessor is configured to manage use of said buffer memory for buffering said data (Paragraph 0026 as shown in Figure 1 of Kitamura).

As per dependent claim 37, the combination of Hubis and Kitamura teach,

- The storage controller of claim 35, wherein said interface adapter includes a direct memory access controller for controlling transfers of said data between said interface adapter and said buffer memory (Column 11 lines 38-44 of Hubis).

As per dependent claim 38, the combination of Hubis and Kitamura teach,

- The storage controller of claim 35, wherein said buffer memory comprises said memory for storing said access table (Paragraph 0026 as shown in Figure 1 of Kitamura). *The Examiner notes that the memory of Kitamura is used for the frequent access of frequently accessed data. The table is accessed frequently. Thus the table can be stored in the memory for ease of accessing.*

As per independent claim 53, the combination of Hubis and Kitamura teach,

- A storage router for providing virtual local storage on remote storage devices to devices, comprising: a buffer providing memory work space for the storage router; (Paragraph 0026 of Kitamura).
- a first controller operable to connect to and interface with a first transport medium, operable to implement access controls for storage space on the storage devices; a second controller operable to connect to and interface with a second transport medium; and (Column 11 lines 8-15 of Hubis). *The Examiner notes that Hubis teach multiple controllers, thereby anticipating the instant limitation.*

- a supervisor unit coupled to the first controller, the second controller and the buffer, the supervisor unit operable to map between devices connected to the first transport medium and the storage devices and to process data in the buffer to interface between the first controller and the second controller to allow access from devices connected to the first transport medium to the storage devices using native low level, block protocols (Column 11 lines 38-53 of Hubis).

As per independent claim 71, the combination of Hubis and Kitamura teach,

- A storage router for providing virtual local storage on remote storage devices to devices, comprising: a buffer providing memory work space for the storage router; (Paragraph 0026 of Kitamura).
- a first controller operable to connect to and interface with a first transport medium, operable to map between devices connected to the first transport medium and the storage devices; a second controller operable to connect to and interface with a second transport medium; and (Column 11 lines 8-15 of Hubis). *The Examiner notes that Hubis teach multiple controllers, thereby anticipating the instant limitation.*
- a supervisor unit coupled to the first controller, the second controller and the buffer, the supervisor unit operable to implement access controls for storage space on the storage devices and to

process data in the buffer to interface between the first controller and the second controller to allow access from devices connected to the first transport medium to the storage devices using native low level, block protocols (Column 11 lines 38-53 of Hubis).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

1. U.S. 7,043,663 Pittelkow et al teach a system and method to monitor and isolate faults that occur in a storage area network.
2. U.S. 6,480,934 Hino et al teach a storage control unit over a storage area network.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew Bradley whose telephone number is (571) 272-8575. The examiner can normally be reached on 6:30-3:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald A. Sparks can be reached on (571) 272-4201. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DAS/mb



Brian R. Peugh
Primary Examiner